

WHAT IS CLAIMED IS:

1. A mechanism for filtering snoop requests to a cache memory, said mechanism comprising:

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a storage including a plurality of entries configured to store corresponding snoop filter indications; and

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a cache controller configured to receive a transaction request including an address and to generate an index for accessing said storage by performing a hash function on said address;

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wherein, said cache controller is further configured to selectively generate a snoop operation to said cache memory for said transaction request dependent upon a snoop filter indication stored in said storage that corresponds to said address.

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2. The mechanism as recited in claim 1, wherein said cache controller is configured to generate said snoop operation to said cache memory for said transaction request if said snoop filter indication is a value indicative that a cache line corresponding to said address was stored within said cache memory.

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3. The mechanism as recited in claim 1, wherein said cache controller is configured to ignore said transaction request if said snoop filter indication is a value indicative that a cache line corresponding to said address is not stored within said cache memory.

4. The mechanism as recited in claim 1, wherein during a first mode of operation and in response to a cache memory access, said cache controller is configured to store

said snoop filter indication in an entry of said storage having an index equal to the hash value of an address associated with said cache line.

5 5. The mechanism as recited in claim 4 further comprising a second storage
including a plurality of entries configured to store second snoop filter indications.

6. The mechanism as recited in claim 5, wherein during a second mode of operation,
said cache controller is further configured to selectively generate a snoop operation to
said cache memory for said transaction request dependent upon a second snoop filter
10. indication stored in said second storage that corresponds to said address.

7. The mechanism as recited in claim 6, wherein during said first mode of operation,
said cache controller is further configured to populate given entries of said second storage
with said second snoop indications based on entries contained in said cache memory.

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8. The mechanism as recited in claim 7, wherein during said second mode of
operation, said cache controller is configured to read an address of each entry in said
cache memory, to generate an index associated with said address and to store a
corresponding second snoop indication within each entry of said second storage
20 corresponding to said index associated with said address.

9. The mechanism as recited in claim 7, wherein said cache controller is further
configured to populate given entries of said second storage in response to said storage
having a predetermined number of said plurality of entries populated with said snoop
25 filter indications.

10. The mechanism as recited in claim 9, wherein while populating said second
storage and in response to detecting a change to a given entry of said cache memory, said

cache controller is configured to update a particular second snoop filter indication in a corresponding entry of said second storage.

11. The mechanism as recited in claim 6, wherein during said second mode of
5 operation, said cache controller is further configured to generate a snoop operation to said cache memory for said transaction request if said given second snoop filter indication is a value indicative that a cache line corresponding to said address was stored within said cache memory

10 12. The mechanism as recited in claim 6, wherein said cache controller is configured to ignore said transaction request if said given second snoop filter indication is a value indicative that a cache line corresponding to said address is not stored within said cache memory.

15 13. The mechanism as recited in claim 7, wherein during said second mode of operation, said cache controller is configured to initialize each of said plurality of entrees of said storage to an initialization value.

14. The mechanism as recited in claim 1, wherein said cache memory includes a
20 plurality of portions and each portion of said cache memory corresponds to a respective portion of said plurality of entries of said storage.

15. The mechanism as recited in claim 14, wherein in response to said transaction
25 request, said cache controller is configured to generate a snoop operation to a given one of said portions of said cache memory if said corresponding respective portion of said plurality of entries of said storage is populated with a predetermined number of said snoop filter indications.

16. The mechanism as recited in claim 15, wherein in response to a given respective portion of said plurality of entries being populated with a predetermined number of said snoop filter indications, said cache controller is configured to read an address of each entry in said given one of said portions of said cache memory, to generate an index
5 associated with said address and to store a corresponding second snoop indication within each entry of said given respective portion of said plurality of entries of said storage corresponding to said index associated with said address.

17. A method of filtering snoop requests to a cache memory, said method comprising:
10 storing corresponding snoop filter indications within a plurality of entries of a storage; and

receiving a transaction request including an address and generating an index for
15 accessing said storage by performing a hash function on said address;

selectively generating a snoop operation to said cache memory for said transaction request dependent upon a snoop filter indication stored in said storage that corresponds to said address.

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18. The method as recited in claim 17 further comprising generating said snoop operation to said cache memory for said transaction request if said snoop filter indication is a value indicative that a cache line corresponding to said address was stored within said cache memory.

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19. The method as recited in claim 17 further comprising ignoring said transaction request if said snoop filter indication is a value indicative that a cache line corresponding to said address is not stored within said cache memory.

20. The method as recited in claim 17 further comprising storing said snoop filter indication in an entry of said storage having an index equal to the hash value of an address associated with said cache line during a first mode of operation and in response to
5 a cache memory access.

21. The method as recited in claim 20 further comprising storing second snoop filter indications within a plurality of entries of a second storage.

10 22. The method as recited in claim 21 further comprising, during a second mode of operation, selectively generating a snoop operation to said cache memory for said transaction request dependent upon a second snoop filter indication stored in said second storage that corresponds to said address.

15 23. The method as recited in claim 22 further comprising, during said first mode of operation, populating given entries of said second storage with said second snoop indications based on entries contained in said cache memory.

20 24. The method as recited in claim 23 further comprising, during said second mode of operation, reading an address of each entry in said cache memory, generating an index associated with said address and storing a corresponding second snoop indication within each entry of said second storage corresponding to said index associated with said address.

25 25. The method as recited in claim 23 further comprising populating given entries of said second storage in response to said storage having a predetermined number of said plurality of entries populated with said snoop filter indications.

26. The method as recited in claim 25 further comprising, in response to detecting a change to a given entry of said cache memory, updating a particular second snoop filter indication in a corresponding entry of said second storage.

5 27. The method as recited in claim 22 further comprising during said second mode of operation, generating a snoop operation to said cache memory for said transaction request if said given second snoop filter indication is a value indicative that a cache line corresponding to said address was stored within said cache memory

10 28. The method as recited in claim 22 further comprising ignoring said transaction request if said given second snoop filter indication is a value indicative that a cache line corresponding to said address is not stored within said cache memory.

15 29. The method as recited in claim 23 further comprising initializing each of said plurality of entrees of said storage to an initialization value during said second mode of operation.

20 30. The method as recited in claim 17, wherein said cache memory includes a plurality of portions and each portion of said cache memory corresponds to a respective portion of said plurality of entries of said storage.

25 31. The method as recited in claim 30 further comprising, in response to said transaction request, generating a snoop operation to a given one of said portions of said cache memory if said corresponding respective portion of said plurality of entries of said storage is populated with a predetermined number of said snoop filter indications.

32. The method as recited in claim 31 further comprising, in response to a given respective portion of said plurality of entries being populated with a predetermined

number of said snoop filter indications, reading an address of each entry in said given one of said portions of said cache memory, generating an index associated with said address and storing a corresponding second snoop indication within each entry of said given respective portion of said plurality of entries of said storage corresponding to said index associated with said address.

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